

LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES



OFFICE OF FISHERIES

INLAND FISH SECTION

PART VI-A

WATERBODY MANAGEMENT PLAN SERIES

IVAN LAKE

LAKE HISTORY & MANAGEMENT ISSUES

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED EVERY THREE YEARS

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LAKE HISTORY

GENERAL INFORMATION

Parish/ location:

Bossier

Date Lake Formed:

Dam project started in 1955, completed in 1958 and flooded shortly thereafter, reaching pool stage at an unknown date in the spring of 1958.

Impoundment:

Ivan Lake dam consists of a 1,300 ft. earthen embankment with a 35ft. wide crown. The crown includes an 18ft. blacktop roadway running total length and beyond with an approximate 3 to 1 slope. Dam extends across Caney Creek. The entire project lies within the Bodcau Wildlife Management Area (WMA).

Size (surface area):

520 acres

Watershed:

55 square miles of area (35,200 acres) drain into Ivan Lake. The ratio of watershed to lake surface is 68:1.

Watershed characteristics: Plantation pine, mixed hardwoods, and pasture. Soils are acidic, sandy, and somewhat infertile. Soil pH is low. Tests from lake soil indicate a pH ranging from 5.15 to 5.28.

Pool Stage:

Surface elevation of Ivan Lake is set at the spillway elevation of 200 feet MSL (mean sea level).

Spillway Width:

200 ft. non-gated Ogee spillway and stilling basin

Drawdown (outlet) structure description:

Intake Structure—36 inch CPP (Corrugated Plastic Pipe) with circular gate and concrete structure with trash gate

Outlet Structure—36 inch CPP (Corrugated Plastic Pipe) set in concrete headwall with grouted rip-rap outflow channel.

Who Controls:

Owned by U.S. Army Corps of Engineers (USACE), the Louisiana Department of Wildlife and Fisheries (LDWF) was granted license to manage the lake on October 22, 2009. Prior to this time, the Bossier Parish Police Jury (BPPJ) was licensed to manage the reservoir. ([APPENDIX I](#) contains a copy of the current license). The dam and spillway structure are controlled and maintained by the Louisiana Department of Transportation and Development (DOTD).

LAKE AUTHORITY

LDWF is authorized by USCOE to manage Ivan Lake and Bodcau WMA.

ACCESS**Boat Ramps:**

There is one boat launch located near the dam that includes a primitive camping area and outdoor toilets. To reach ramp, travel west on LA Hwy 160 from Cotton Valley. Turn right on Ivan Lake Rd, and then travel northward across dam to ramp facility. Coordinates for the boat ramp on Ivan Lake are 32.830714° N and -93.492836° W. See Ivan Public Boat Ramps - [APPENDIX II](#).

Permits:

LDWF self-clearing permit is required for all activities on Ivan Lake. A permit station is located near the public launch facility. In addition to a self-clearing permit, persons using the WMA for any purpose other than hunting must possess one of the following: a valid Wild Louisiana Stamp, a valid Louisiana fishing license, or a valid Louisiana hunting license. Persons younger than 16 or older than 60 years of age are exempt from this requirement. A WMA Hunting Permit is required for persons' age 18-59 to hunt on the WMA. For more information concerning permit requirements refer to the current Louisiana Hunting Regulations Pamphlet, or visit the Department of Wildlife and Fisheries website; <http://www.wlf.louisiana.gov/>

Piers:

In 2013, LDWF constructed five public fishing piers on Ivan Lake, including one ADA pier accessible by handicap parking and sidewalk (Figures 1 and 2). Also, a boat mooring dock is located adjacent to the boat launch.



Figure 1. Handicap accessible pier. LDWF file photo.



Figure 2. Typical pier construction. LDWF file photo.

State/Federal Facilities:

Ivan Lake lies within Bodcau Wildlife Management Area which is owned by the USACE and managed by LDWF. Persons using Ivan Lake are subject to the same regulations, permit and license requirements as those utilizing other areas of Bodcau WMA. See the section above on “Permits” and consult the current Louisiana Hunting Regulation Pamphlet for more information.

A small park area including picnic tables, primitive camp sites, and outdoor toilets are associated with the fishing piers and public boat launch.

Artificial Reefs:

Three types of reef structures have been deployed on the lower portion of Ivan Lake: 1) Plastic crate towers, 2) Vertical Christmas trees, and 3) Pallet stake beds (Figures 3, 4 and 5). The plastic crate towers are marked by a single buoy, and the Christmas trees (70) are surrounded by four buoys aligned in a square-shaped pattern. Twenty stake bed pallets have been sunk along the perimeter of the buoys.



Figure 3. Plastic tower structure. LDWF file photo.



Figure 4. Christmas tree reefs. LDWF file photo.



Figure 5. Pallet stake bed. LDWF file photo.

SHORELINE DEVELOPMENT

Ivan Lake is encompassed by a mixed-pine/hardwood forest shoreline. A few residential properties adjoin the WMA within view of the lake.

PHYSICAL DESCRIPTION OF LAKE

Shoreline Length:

9.5 miles

Timber Type:

Prior to impoundment, the bottom of Ivan Lake consisted of a mixed pine - deciduous forest with bottomland hardwoods along the creek channel. Very little timber was removed prior to flooding the lakebed. Subsequently, dying timber formed a jungle of dead logs, snags, and stubble. Some of the remaining timber on the lower end of the lake was removed during a drawdown in 1967.

Average Depth:

6.46 feet

Maximum Depth:

20 feet

Total Water Volume at Pool Stage:

3,360 acre feet storage capacity

Natural Seasonal Water Fluctuation:

2-3 feet

EVENTS/ PROBLEMS

Early Drawdowns

According to unpublished LDWF materials, the timber in Ivan Lake died after impoundment of the lake. The resulting habitat included tangle of dead logs, snags and stubble. Most likely prepared during the early 1960's, this "Initial Management Plan" can be found in [APPENDIX III](#). Woody debris precluded much recreational use of the lake, especially skiing, and swimming. When this early plan was prepared, native submergent and emergent aquatic vegetation had already become problematic in the shallow areas of the lake.

Several of the recommendations outlined in the initial management plan were implemented when the lake was completely dewatered in 1967. Timber was cleared and snagged on the lower end of the lake. A concrete boat ramp was also constructed adjacent to the picnic area near the dam at this time.

The early plan also called for annual fall/winter drawdowns to control aquatic vegetation and increase fish production. The recommended drawdowns were to be conducted annually for five years. However, the drawdowns were not implemented on an annual basis.

Ivan Lake was completely dewatered in the latter part of July 1974 to allow the Department of Public Works to make extensive repairs to the earthen dam and renovations to the spillway.

Recent Drawdowns and Lakebed Renovation

Ivan Lake was completely dewatered in 2004. The dewatering was unintentional. It occurred when the control structure was not closed at the proper time during a drawdown for hydrilla control (Figure 6). The drawdown was to be the first of five consecutive fall-winter drawdowns for hydrilla control in accordance with the Ivan Lake Aquatic Vegetation Management Plan prepared by LDWF. A fish kill followed this accidental dewatering, and an investigation showed a large number of sport fish died as a result of this event. Once it was discovered that the lake had been drained, DOTD was contacted, the gates were closed, and the lake was allowed to refill to the prescribed 6' drawdown level. Evaluations of the remaining fish population by LDWF personnel revealed an abundance of rough fish and few remaining sport fish.



Figure 6. Ivan Lake following accidental complete dewatering in the fall of 2004. LDWF file photo.

Ivan Lake has needed lakebed renovation for several years, and this unfortunate circumstance yielded an opportune time to implement such a plan. The reservoir was experiencing symptoms associated with the aging or eutrophication process of a lake. Bottom sediments were comprised largely of fine silts, sands, and organic muck from the excessive aquatic plant growth and leaf litter from adjacent forests.

During the second scheduled drawdown, the lake was completely dewatered at the request of the Louisiana Department of Transportation and Development (DOTD) so that a leaking control gate could be inspected. This drawdown began on September 15, 2005. Good drying conditions were observed on many areas of the lake bed that fall.

The third drawdown in the series was delayed until early September 2006 to facilitate repairs being made on the Bodcau dam located downstream from Ivan Lake. The lake was dewatered to the maximum extent to allow for maximum drying of the lake bed. The control gate remained open throughout the year as DOTD and the USACE inspected and made repairs to the control structure. The control gate was to remain open indefinitely in preparation for a lake renovation project.

The Bossier Parish Police Jury (BPPJ) was licensed by the USACE for construction, operation and maintenance of dam, lake, and recreational area known as Ivan Lake in April of 1955. This license was renewed in April of 1980 for a second 25-year period. On April 6, 2005 the license expired and the BPPJ decided not to renew the license. The USACE inquired about the possibility of LDWF assuming the operation and maintenance of Ivan Lake following the expiration date of the lease in April of 2005. The letter, which is incorrectly dated April 11, 2004, is displayed in [APPENDIX IV](#). The issue of greatest concern expressed in this correspondence was the possibility of Ivan Lake being closed for public use. Upon receipt of the correspondence, LDWF began investigating the possibility of assuming responsibility for Ivan Lake.

Prior to LDWF entering into an agreement for Ivan Lake, several issues related to maintenance and repair had to be resolved. This included repairs to the dam, control structure and outflow pipe, along with ensuring that other entities would continue routine maintenance of the dam, picnic area, and restroom facility. LDWF also wanted to make sure that other improvements to the lake such as fishing piers, fish attractors, channel marking, and shoreline enhancements could be achieved under the terms of the agreement. Once plans and agreements were reached, Ivan Lake was incorporated into the USACE-LDWF Agreement along with Bodcau WMA. The current License, dated October 22, 2009 is for a 25-year term.

A meeting was held during June 2010 to begin planning the renovation of Ivan Lake. The parties involved in the renovation discussions included: BPPJ, DOTD, USACE, State Senator Adley's Office, and LDWF. The primary objective of the meeting was to address the repairs or replacement of the outflow conduit and address the recent soil slides along the berm of the dam. It was agreed that the BPPJ and DOTD would be responsible for replacement of the outflow conduit and LDWF would provide funding for construction of a secondary support berm for the dam.

Engineers from DOTD and the BPPJ produced plans for repair of the dam. The project was submitted for bids and completed in January 2012. Soil from the lake bed was used for construction of the secondary support berm.

Restoration projects completed by LDWF include shoreline improvements for bank access, fishing piers, boat lanes, artificial reefs, and sportfish restocking. A conceptual design of these improvements to the lake can be found in [APPENDIX V](#).

A cultural resource survey was conducted to insure that no significant archeological sites would be impacted by the renovation work on the lake bed. The areas included in this survey are depicted by the map in [APPENDIX VI](#).

On October 12, 2010 an application of 5% liquid rotenone was made to the remaining pockets of water found within the lakebed (Figures 7 and 8). The application was made by LDWF personnel with assistance from local USACE personnel. This fish eradication effort was intended to remove any undesirable fish prior to future restocking efforts. Moribund fish observed following the treatment included spotted gar, bigmouth buffalo, largemouth bass, channel catfish, and gizzard shad. Several weeks after the treatment, 800 yards of 2" flag webbing was deployed in the creek and borrow pit, then checked periodically over the course of a month. One decomposed spotted gar was collected during this effort.



Figure 7. Application of liquid rotenone to water remaining in creek channel at maximum drawdown in an effort to eradicate the existing fish population prior to restocking following renovations to Ivan Lake. LDWF file photo taken October 12, 2010.



Figure 8. Liquid rotenone applied to creek channel and other areas not accessible by boat. LDWF file photo taken October 12, 2010.

MANAGEMENT ISSUES

AQUATIC VEGETATION

Native emergent and submergent aquatic vegetation became problematic on Ivan Lake in the early 1960's. The most prevalent submersed species at that time were bladderwort (*Utricularia* spp.), coontail (*Ceratophyllum demersum*), and pondweed (*Potamogeton* spp.). Prevalent emergent aquatic vegetation species were watershield (*Brasenia schreberi*), water primrose (*Ludwigia octovalvis*), and cat-tail (*Typha* spp.).

A drawdown was conducted in 1967 for clearing timber. During this time the lake was drawn down to the lowest possible level. Correspondence indicates that another drawdown was requested by the Bossier Parish Police Jury in 1969 for vegetation control. It is not known whether this drawdown was conducted. Correspondence indicates that aquatic vegetation was problematic again in 1972.

Ivan Lake has extensive areas of shallow water that are susceptible to utilization by aquatic macrophytes (Figure 9). It is suspected that aquatic plant growth increased over time as the Ivan Lake eutrophication process accelerated.



Figure 9. Aquatic vegetation is problematic in many areas of Ivan Lake due to the large expanses of shallow water. LDWF file photo.

Information is lacking to describe the specifics of Ivan Lake vegetation problems until the mid-1990's. In 1997, vegetation surveys were conducted by LDWF and the USACE. Problem plants noted were coontail (*Ceratophyllum demersum*), American lotus (*Nelumbo lutea*), alligator weed (*Alternanthera philoxeroides*), Eurasian watermilfoil (*Myriophyllum spicatum*), variable-leaf milfoil (*Myriophyllum heterophyllum*) and hydrilla (*Hydrilla verticillata*). Hydrilla was first documented during 1996, and was found throughout the lake during the survey conducted by LDWF on June 10, 1997. Total coverage of aquatic vegetation was estimated at 20% or approximately 100 acres during each survey.

Concern from the public and the BPPJ over aquatic vegetation problems and lack of angler success prompted a series of meetings between LDWF, USACE and BPPJ in 1997. Options included herbicide applications, biological controls, and drawdowns. A decision was reached to proceed with a 6' drawdown for aquatic vegetation control that year.

By 2002, hydrilla infestations were severe enough that a series of drawdowns were recommended as a control measure. Surveys conducted in 2003 revealed submerged

vegetation covered approximately 35% of the lake, with the most problematic species being hydrilla. In 2004, a control plan was implemented to reduce hydrilla infestations ([APPENDIX VII](#)).

Hydrilla coverage was found to be greatly reduced during the 2005 vegetation survey. A determination was made to continue with the existing plan for hydrilla control and continue the drawdowns. Ivan Lake was dewatered much of the time from 2005-2012 for various reasons pertaining to lake renovation (see Table 1, Drawdown History section). An aerial view of Ivan Lake during one of the drawdowns from 2007 is shown in Figure 10. Since the renovation, hydrilla has remained at very low levels and is generally only found in the area around the boat launch and park.

In early 2013, submerged aquatic vegetation began expanding in the shallow areas of Ivan Lake. By March of 2013, estimated submerged & emergent vegetation totaled 120 acres of coverage. The primary species were Eurasian watermilfoil and fanwort along with some hydrilla. This expansion of coverage combined with historical trends led to the decision to introduce triploid grass carp as a preventive control measure.

Giant salvinia (*Salvinia molesta*) was found adjacent to the boat ramp within a couple months after the lake re-filled in February, 2013. LDWF crews have made periodic, foliar herbicide applications to control the plant; but it has persisted at low levels (<10 acres' coverage) and has yet to impede boating access on the lake. A floating, oil-spill, containment boom was deployed across the spillway in April of 2013 in an attempt to prevent salvinia from escaping the lake and infesting the Bayou Bodcau drainage below.

Since 2013, submerged native vegetation and some hydrilla have persisted with approximately 100 acres of the lake having some coverage despite annual stockings of grass carp. Adequate complex cover (marginal shoreline vegetation and woody debris) exists in the lake to support a balanced fish population even if SAV were eradicated. Six hundred sub-adult TGC were introduced in early 2013 (three fish/vegetated acre) to control an increase in Eurasian watermilfoil. The SAV coverage declined by the fall of 2013, but continued to threaten boating access in many areas of the lake during 2014. An additional 600 TGC (five fish/vegetated acre) were added in November of 2014. Another 250 TGC were added in the winter of 2015, and again in 2016 at a rate of approximately 2.5 fish/vegetated acre).

The carp stockings can be viewed as successful as plants have not returned to historical, problematic levels experienced prior to the lake renovation. It is quite possible that many of the carp are leaving the lake during high water events, thus preventing the complete removal of all submerged vegetation in the lake.

In 2015, American lotus and fragrant water lily again caused boating access problems in the upper reaches of both arms of Ivan Lake. The District 1 spray crew treated a total of 233 acres of aquatic vegetation during 18 operations on Ivan Lake in 2015. They successfully treated 171 acres of lotus and water lily, and coverage was greatly

reduced by late summer of 2015. LDWF District 1 herbicide application crew made monthly visits to Ivan Lake in 2016 to routinely treat the lotus and water lilies present. Coverage was held in check by treating over 100 acres of vegetation with foliar herbicides.

Aquatic Vegetation Surveys and Type Maps:

Surveys of aquatic vegetation conducted in 1997 did not include a type map. Type map surveys were conducted in 2002, 2005, and 2013-16. See [APPENDIX VIII](#) for the latest vegetation type map.

Aquatic Vegetation Treatment History:

Drawdown conducted in 1997 for alligator weed, lotus, coontail and hydrilla control. Drawdowns were conducted annually from 2004 through 2006 for hydrilla control. From 2007 until 2012, the gate remained open which resulted in multiple, short-duration lake refills.

Chemical Control

LDWF spray crews have applied foliar herbicides on Ivan Lake periodically since the 2012 renovation. Crews have typically concentrated efforts on giant salvinia, American lotus, and fragrant water lily, as all three species are a threat to boating access on the upper reaches of the lake.

Table 1. Annual plant infestations and acres treated on Ivan Lake for 2013-2016.

Treatment Year	Primary Plant Species	Herbicides Used	Acres Treated
2013	Giant salvinia	Tribune-10 gals. (0.75 gal/acre & 1 gal/acre)	12
2014	American Lotus, water lily, giant salvinia	Platoon-74 gals. (0.5 gal/acre) 2,4-D-5 gals. (0.5 gal/acre) Clearcast-9 gals. (0.5 gal/acre) Ecomazapyr 2SL- 3.75 gals. (0.75 gal/acre) Tribune-0.75 gals. (0.75 gal/acre)	182
2015	American Lotus, water lily, giant salvinia	Platoon-91.5 gals. (0.5 gal/acre) 2,4-D- 22 gals. (0.5 gal/acre) Round-Up Custom-2.25 gals. (0.75 gal/acre)	233

		Tribune-2.25 gals. (0.75 gal/acre)	
2016	Giant salvinia, cut grass, American lotus	Platoon-5 gals. (0.5 gal/acre) Round-Up Custom-32.25 gals. (0.75 gal/acre) Aquaneat-30.75 gals (0.75 gal/acre) Tribune-9 gals. (0.75 gal/acre)	106

Biological Control

Sub-adult size (11"-13" TL) triploid grass carp (TGC) have been added to Ivan Lake to control the invasive hydrilla and other native submerged aquatic vegetation that was problematic prior to the lake renovation. The stockings have not eliminated submerged vegetation, but may have prevented it from returning to historical, problematic levels. Given the spillway width and the large watershed, it is likely that some of the grass carp are leaving the lake during high water events, and may explain why the vegetation has persisted.

LDWF has recommended a macrophyte coverage range of 15-30% as a goal beneficial to the development and sustainability of sportfish populations. It should be noted, that the current average coverage of approximately 100 acres is beneficial (20%) from a fisheries management standpoint, and is deemed acceptable by LDWF since boating access is not greatly limited.

Table 2. Triploid grass carp (TGC) stockings and associated vegetation coverages of Ivan Lake, 2013-2016.

Year	# TGC stocked	Rate (#/vegetated acre)	Acres of submerged vegetation present
2013	600	5	121.5
2014	600	5	117
2015	250	2.5	~100
2016	250	2.5	100

HISTORY OF REGULATIONS

Recreational

Statewide regulations have been in effect for all species since impoundment.

The statewide recreational fishing regulations may be viewed at the link below:
<http://www.wlf.louisiana.gov/fishing/regulations>

Commercial

The use of fish nets and traps are prohibited in Ivan Lake.

Additionally, commercial activities are prohibited without a permit issued by the Secretary of LDWF.

The statewide commercial fishing regulations may be viewed at the link below:
<http://www.wlf.louisiana.gov/fishing/regulations>

DRAWDOWN HISTORY

Ivan Lake has been drawn down for various reasons since its impoundment ranging from construction improvements to vegetation control (Table 3).

Table 3. Drawdown history of Ivan Lake, LA from 1967 to 2016.

Year	Date(s)	Depth Below Pool	Purpose
1967	Unknown	18 Feet- Maximum	Clear timber. Concrete boat ramp built during this time.
1969	Unknown	Unknown	May of 1969, letter from BPPJ letter requesting USACE to lower lake for vegetation control-no further documentation on file.
1974	End of July	18 Feet- Maximum	Dam and spillway renovation. Public Works estimated that approximately 85% water body coverage be reduced for repairs.
1997	August 18- December 15	6 Feet	Vegetation control and maintenance & repair of structures.
2002	Sept 3-Jan 1, 2003	3-4" per day No depth specified	Hydrilla control-did not take place because request processed too late to meet necessary dates for hydrilla control
2003	Sept 13-Jan 19, 2004	6 Feet	Hydrilla control-did not take place- no letter was sent requesting the drawdown from BPPJ.
2004	Sept 13-Jan 24, 2005	6 Feet	Hydrilla control-first in a series of five consecutive drawdowns. Lake was accidentally dewatered at a rapid rate to maximum level by DOTD resulting in major fish kill. Discovered on Oct 4 th .
2005	Sept 15-Jan 23, 2006	8 Feet scheduled then to 18ft.	Hydrilla control - second in series of 5. Proposed 8' but DOTD requested maximum to make repairs to and inspect the control structure.
2006	Aug 28-Jan 31, 2007*	18 Feet Maximum	Hydrilla Control-3 rd in series of 5, dewatered to maximum to allow more drying of lake bed in preparations for renovation project. Delayed opening until early Sept due to repairs being made downstream on Bodcau Dam. Gates remained open throughout 2007 as USACE and DOTD made

			necessary inspections and repairs to control structures.
2007	All Year	18 Feet Maximum	Gates remained open all year for necessary repairs and inspections. Water levels fluctuated drastically during this time as the lake filled and drained several times due to large watershed, thus prevent growth of problematic terrestrial plants such as willow trees. This represents the fourth year of the series of 5 drawdowns for hydrilla control.
2008	All year	18 Feet Maximum	Fifth in series of 5 for hydrilla control. Maximum depth to get most drying benefits. Gates were left open until further notice pending action by LDWF to take control of lease and renovate lake bottom.
2009	All Year	18 Feet Maximum	Renovation
2010	All Year	18 Feet Maximum	Renovation
2011	All Year	18 Feet Maximum	Renovation
2012	Gate closed February 14, 2012	18 Feet Maximum	Renovation



Figure 10. Aerial view of Ivan Lake following complete dewatering in preparation for lake renovations, 2007. LDWF file photo.

FISH KILLS/ DISEASE HISTORY, LMBV

1967- Lake completely dewatered for repairs to dam and spillway. There is no record in the files at District 1 office regarding fish kills during this period. However, there are letters in the following years requesting stocking due to apparent reduction in fish populations. Ronald W. Christ, Technician Supervisor for LDWF in District 1, recalls this event as his family and other local citizens went to the lake during the dewatering and caught fish that were piping in the creek channel and borrow pit near the dam.

2004- Ivan Lake was undergoing a prescribed drawdown of 6 feet below pool for hydrilla control when the lake was inadvertently drained to the maximum extent. On October 4, 2004 a major fish kill was investigated. Due to conditions on the lake, a quantitative count could not be generated. It can be surmised that a majority of fish perished in the event. Subsequent sampling yielded few fish. Fish that were collected were generally small and of undesirable species.

Largemouth bass from Ivan Lake have not been tested for largemouth bass virus. No fish kills have occurred that would indicate the largemouth bass virus is a problem in Ivan Lake.

CONTAMINANTS/POLLUTION

A Fish Consumption Advisory was issued for Ivan Lake on 11/20/00. The advisory indicates unacceptable levels of mercury in bowfin and largemouth bass. See [APPENDIX IX](#) for complete details of advisory.

The Louisiana Department of Environmental Quality is initiating mercury testing in fish in public waters beginning in 2017. The current Ivan Lake advisory is to be re-evaluated in the near future.

BIOLOGICAL

Fish Sampling History:

Ivan Lake has been sampled for fisheries resources since impoundment through 2016 (Table 4).

Table 4. Historical, present and proposed fish samples taken on Ivan Lake, LA from 1963 to 2019.

IVAN LAKE FISHERIES SAMPLING	
YEAR	GEAR
1963	2, 1-acre rotenone samples
1967	2, 1-acre rotenone samples
1972 (July)	2, 1-acre rotenone samples
1977 (May)	1, 1-acre rotenone sample

1992 (Fall)	Electrofishing 1-15-minute sample Age and Growth samples collected
1993 (June)	Electrofishing 3+-15 minute samples (3,000 seconds)
1997 (April)	Electrofishing 4-15 minute samples
1998 (May)	Electrofishing 4-15 minute samples
2001 Spring and Fall	Electrofishing 4-15 minute samples Spring 5-15 minute samples in Fall (including forage sample plus age and growth)
2004 (December)	Gill nets 2 stations 2 samples each
2005	Electrofishing(March) 3-15 minute samples Shoreline seine 3 stations (July)
2014	Electrofishing 4-15 minute samples Spring Electrofishing 4-15 minute samples Fall 4-225 second Forage Samples Fall 3 – 1” Bar, 3.5’ dia. Lead Net Sets
2015	Electrofishing 4-15 minute samples Spring Electrofishing 4-15 minute samples Fall 4-225 second Forage Samples Fall 3 – 1” Bar, 3.5’ dia. Lead Net Sets
2016	Electrofishing 4-15 minute samples Spring Electrofishing 4-15 minute samples Fall 4-225 second Forage Samples Fall 3 – 1” Bar, 3.5’ dia. Lead Net Sets
2017	Electrofishing 4-15 minute samples Spring Electrofishing 4-15 minute samples Fall 4-225 second Forage Samples Fall
2018	Electrofishing 4-15 minute samples Spring Electrofishing 4-15 minute samples Fall 4-225 second Forage Samples Fall
2019	Electrofishing 4-15 minute samples Spring Electrofishing 4-15 minute samples Fall 4-225 second Forage Samples Fall

Lake Records:

There are no trophy fish records kept specifically for Ivan Lake. For more information on state records, see Louisiana Outdoor Writers Organization website: <http://www.laoutdoorwriters.com/LinkClick.aspx?fileticket=raz4WbMqdQY=&tabid=87>

Stocking History:

Ivan Lake received initial fish stockings in 1958, then a stocking of channel catfish in 1970 (Table 5).

Table 5. The stocking history of Ivan Lake, LA from 1958 to 2016

Date	Number stocked/Species stocked
1958	Initial stocking of bluegill and largemouth bass actual numbers stocked unknown
1970	35,000 channel catfish fingerlings
2012	186,000 adult and 500,000 fingerling bluegill (BW, BFFH, USFHN) 84,000 adult and 107,000 fingerling redear sunfish (BW, BFFH, USFHN) 42,000 Florida largemouth bass fingerlings (BFFH) 4,000 black crappie (BW) 10,000 channel catfish (BFFH) 12,000 adult threadfin shad (AS)
2013	200 brood stock Florida largemouth bass (approx. 4 lbs. average) BFFH 600 triploid grass carp (10 – 15” TL) (KEO) 1,400 adult threadfin shad (JMMS) 12,692 adult threadfin shad (Monroe)
2014	26,001 channel catfish fingerlings (BFFH) 8,390 Florida largemouth bass fingerlings (CLFH) 600 triploid grass carp (10-15” TL) (JMMS)
2015	6,749 Florida largemouth bass fingerlings (BFFH) 250 triploid grass carp (10-15” TL) (HSFH)
2016	250 triploid grass carp (10-15” TL) (JMMS)

***BFFH=Booker Fowler Fish Hatchery**

*CLFH=Cross Lake Fish Hatchery

*JMMS=J.M. Malone & Son Inc.

*HSFH=Hopper Stevens Fish Hatchery

*AS=American Sportfish

*BW=Beechwood Hatchery LDWF

*KEO=Keo Fish Farms

Monroe=Monroe Fish Hatchery LDWF

USFHN=U.S. Fish Hatchery Natchitoches Louisiana

Species Profile:

List of indigenous freshwater fishes found in Ivan Lake through standardized sampling efforts is found in Table 4 below.

Table 4. List of indigenous freshwater fishes found in Ivan Lake

Gar Family, LEPISOSTEIDAE

Spotted gar, *Lepisosteus oculatus* (Winchell)

Bowfin Family, AMIIDAE

Bowfin, *Amia calva* Linnaeus

Herring Family, CLUPEIDAE

Gizzard shad, *Dorosoma cepedianum* (Lesueur)

Minnow Family, CYPRINIDAE

Golden shiner, *Notemigonus crysoleucas* (Mitchill)

Sucker Family, CATOSTOMIDAE

Lake chubsucker, *Erimyzon sucetta* (Lacépède)

Bigmouth buffalo, *Ictiobus cyprinellus* (Valenciennes)

Freshwater Catfish Family, ICTALURIDAE

Black bullhead, *Ameiurus melas* (Rafinesque)

Yellow bullhead, *Ameiurus natalis* (Lesueur)

Channel catfish, *Ictalurus punctatus* (Rafinesque)

Flathead catfish, *Pylodictis olivaris* (Rafinesque)

Pike Family, ESOCIDAE

Chain pickerel, *Esox niger* Lesueur

Pirate Perch Family, APHREDODERIDAE

Pirate perch, *Aphredoderus sayanus* (Gilliams)

Killifish Family, CYPRINODONTIDAE

Golden topminnow, *Fundulus chrysotus* (Günther)

Blackstripe topminnow, *Fundulus notatus* (Rafinesque)

Livebearer Family, POECILIIDAE

Western mosquitofish, *Gambusia affinis* (Baird and Girard)

Silverside Family, ATHERINIDAE

Brook silverside, *Labidesthes sicculus* (Cope)

Sunfish Family, CENTRARCHIDAE

Flier, *Centrarchus macropterus* (Lacépède)

Green sunfish, *Lepomis cyanellus* Rafinesque

Warmouth, *Lepomis gulosus* (Cuvier)

Bluegill, *Lepomis macrochirus* (Rafinesque)

Longear sunfish, *Lepomis megalotis* (Rafinesque)
 Redear sunfish, *Lepomis microlophus* (Günther)
 Redspotted sunfish, *Lepomis miniatus* Jordan
 Northern largemouth bass, *Micropterus salmoides* (Lacépède)
 Florida largemouth bass, *Micropterus floridanus* Kassler et al.
 White crappie, *Pomoxis annularis* Rafinesque
 Black crappie, *Pomoxis nigromaculatus* (Lesueur)

Largemouth Bass Genetics:

Table 6. The largemouth bass genetic analysis results for Ivan Lake, 2014-2015.

Year	Number	Northern	Florida	Hybrid	Florida Influence
2014	52	81%	10%	9%	19%
2015	72	79%	7%	14%	21%

Threatened/Endangered/Exotic Species:

Bald eagles have been sighted on the lake by District 1 biologists.

CREEL

No creel surveys have been conducted on Ivan Lake.

HYDROLOGICAL CHANGES

Ivan Lake was impounded in 1958. The lake was completely dewatered in 1967 and again in 1974 for repairs and renovation work. In 2004, the lake was accidentally completely dewatered during the first in a series of five scheduled drawdowns for hydrilla control. From 2007 to 2012, Ivan Lake remained dry with the flood control gates open for renovation efforts. Due to the large watershed, Ivan Lake filled and drained multiple times during these six years. On February 14, 2012, the gates were closed, and the lake returned to normal pool.

WATER USE

Uses include fishing, waterfowl hunting, swimming, and boating. No personal watercraft or towable watersports are allowed on Ivan Lake.

APPENDIX I

[\(return to who controls\)](#)

Current License Agreement



REPLY TO
ATTENTION CF:

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
4155 CLAY STREET
VICKSBURG, MISSISSIPPI 39183-3435

April 23, 2010

RECEIVED

APR 26 2010

LEGAL DIVISION

Real Estate Division
Realty Services Branch

SUBJECT: Bayou Bodcau Wildlife Management Area, Louisiana,
Louisiana Department of Wildlife and Fisheries, License
Contract No. DACW39-2-10-5

Louisiana Department of Wildlife and Fisheries
Attention: Ms. Yolanda Martin
Suite 462
Post Office Box 98000
Baton Rouge, Louisiana 70898

Dear Ms. Martin:

Enclosed for your files is an executed original of subject license allowing the Louisiana Department of Wildlife and Fisheries to continue to operate and maintain the Bayou Bodcau Wildlife Management Area (enclosure 1).

If you should have any questions concerning this instrument, please contact Mr. Guy Barnett of my staff at (601) 631-7294.

Sincerely,

A handwritten signature in black ink, appearing to read "R. S. Wood".

Robert S. Wood
Chief, Real Estate Division

Enclosure

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5

DEPARTMENT OF THE ARMY LICENSE
FOR FISH AND WILDLIFE ACTIVITIES ON
BAYOU BODCAU RESERVOIR
BOSSIER AND WEBSTER PARISHES, LOUISIANA

THE SECRETARY OF THE ARMY, hereinafter referred to as the Secretary, under authority of Section 4, Act of Congress, 22 December 1944, as amended (16 U.S.C. 460d) and Section 3, Fish and Wildlife Coordination Act of 1934, as amended (16 U.S.C. Sec. 663), hereby grants to THE LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES, hereinafter referred to as the grantee, a license to operate and maintain 32,766.08 acres, more or less, for fish and wildlife activities over, across, in, and upon lands of the United States, as identified in Exhibits "A-1", "A-2", and "A-3", attached hereto and made a part hereof, hereinafter referred to as the premises.

THIS LICENSE is granted subject to the following conditions:

1. TERM

This license is granted for a term of twenty five (25) years, beginning 22 October 2009 and ending 21 October 2034, but revocable at will by the Secretary.

2. CONSIDERATION

The consideration for this license is a support role in the operation and maintenance of the premises by the grantee for the benefit of the United States and the general public in accordance with the conditions herein set forth.

3. NOTICES

All correspondence and notices to be given pursuant to this license shall be addressed, if to the grantee to:

Louisiana Department of Wildlife and
Fisheries
Attention: Secretary
Post Office Box 98000
Baton Rouge, Louisiana 70898

Enclosure 1

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5

and if to the United States, to the:

USAED, Vicksburg District Engineer
Attention: Chief, Real Estate Division
4155 Clay Street
Vicksburg, Mississippi 39183-3435

or as may from time to time otherwise be directed by the parties. Notice shall be deemed to have been duly given if and when enclosed in a properly sealed envelope, or wrapper, addressed as aforesaid, and deposited, postage prepaid, in a post office regularly maintained by the United States Postal Service.

4. AUTHORIZED REPRESENTATIVES

Except as otherwise specifically provided, any reference herein to "Secretary", "District Engineer", or "said officer" shall include their duly authorized representatives. Any reference to "grantee" shall include any duly authorized representatives.

5. SUPERVISION BY THE DISTRICT ENGINEER

The use and occupation of the premises shall be subject to the general supervision and approval of the District Engineer, hereinafter referred to as said officer, and to such rules and regulations as may be prescribed from time to time by said officer.

6. STRUCTURES AND EQUIPMENT

The grantee shall have the right, during the term of the license, to erect such structures and to provide such equipment upon the premises to accomplish the purposes of the license and as provided for in the Annual Management Plan. Those structures and equipment shall be and remain the property of the grantee, except as otherwise provided in the condition on RESTORATION.

7. ANNUAL MANAGEMENT PLANS

The grantee shall administer the premises in accordance with an Annual Management Plan which shows the management and development activities to be undertaken by the grantee. No later than 1 October of each year, the grantee will submit the Annual Management Plan to be mutually agreed upon between the grantee and the said officer. Such Annual Management Plan shall include but is not limited to the following:

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5

- a. Plans for management, maintenance, and development activities to be undertaken by the grantee or jointly by the Corps of Engineers and the grantee which shall include plans for any proposed structures and improvements.
- b. The areas to be utilized for agricultural purposes.
- c. The variety and scope of crops to be planted, as well as any rotations.
- d. The type of wildlife cover to be cultivated, if any.
- e. The areas designated for various species of fish and wildlife propagation.

8. FISH AND WILDLIFE ACTIVITIES

- a. The grantee may plant or harvest crops, either directly, by service contract, by sharecrop agreements with local farmers, or by agricultural agreements to provide food and/or habitat for wildlife and for the development and conservation of land, fish and wildlife, forests, and other natural resources. Where feasible, contracts and agreements with third parties shall be by competitive bid procedures.
- b. Any lands not being managed by the grantee for wildlife habitat will be made available for lease by the said officer for agricultural or grazing purposes under conditions which would not be incompatible with the grantee's use of the premises.
- c. The grantee may take, trap, remove, stock, or otherwise control all forms of fish and wildlife on the premises, and may place therein such additional forms of fish and wildlife as it may desire from time to time, and shall have the right to close the area, or any parts thereof from time to time, to fishing, hunting or trapping, provided that the closing of any area to such use shall be consistent with the state laws for the protection of fish and wildlife.

9. ACCOUNTS, RECORDS AND RECEIPTS

- a. All monies received by the grantee from operations conducted on the premises may be utilized by the grantee for the administration, maintenance, operation, and development of the premises. Beginning 5 years from the date of this license and continuing at 5-year intervals, any such monies not so utilized or

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5

programmed for utilization within a reasonable time shall be paid to the said officer. The grantee shall provide an annual statement of receipts and expenditures to the said officer. The said officer shall have the right to perform audits of the grantee's records and accounts.

b. Payment of direct expenses is authorized for planning and development of optimum wildlife habitat including planting of wildlife food plots, necessary timber clearing, erosion control, or habitat improvements such as shelter, restocking of fish and wildlife, and protection of endangered species. Payment of grantee's employees who are directly engaged in such activities at the project is also authorized. However, proceeds will not be used for the payment of general administrative expenses.

c. Proceeds derived from the sale of fishing and hunting leases are not subject to this condition.

10. APPLICABLE LAWS AND REGULATIONS

The grantee shall comply with all applicable federal, state, county, and municipal laws, ordinances, and regulations wherein the premises are located.

11. CONDITIONAL USE BY GRANTEE

The exercise of the privileges herein granted shall be:

- a. without cost or expense to the United States;
- b. subject to the right of the United States to improve, use, or maintain the premises.
- c. subject to other outgrants of the United States on the premises.
- d. personal to the grantee, and this license, or any interest therein, may not be transferred or assigned.

12. CONDITION OF PREMISES

The grantee acknowledges that it has inspected the premises, knows its condition, and understands that the same is granted without any representations or warranties whatsoever and without any obligation on the part of the United States.

13. PROTECTION OF PROPERTY

The premises shall at all times be protected and maintained in good order and condition by and at the expense of the grantee. The grantee shall be responsible for any damage that may be caused to the property of the United States by the activities of the grantee under this license, and shall exercise due diligence in the protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States damaged or destroyed by the grantee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the grantee to a condition satisfactory to said officer, or at the election of said officer, reimbursement made therefore by the grantee in an amount necessary to restore or replace the property to a condition satisfactory to said officer.

14. RESTORATION

On or before the expiration of this license or its termination by the grantee, the grantee shall vacate the premises, remove the property of the grantee, and restore the premises to a condition satisfactory to said officer. If, however, this license is revoked, the grantee shall vacate the premises, remove said property, and restore the premises to the aforesaid condition within such time as the said officer may designate. In either event, if the grantee shall fail or neglect to remove said property and restore the premises, then, at the option of said officer, the property shall either become the property of the United States without compensation therefore, or said officer may cause the property to be removed, and no claim for damages against the United States or its officers or agents shall be created by or made on account of such removal and restoration work. The grantee shall also pay the United States on demand any sum which may be expended by the United States after the expiration, revocation, or termination of this license in restoring the premises.

15. NON-DISCRIMINATION

a. The grantee shall not discriminate against any person or exclude them from participation in the grantee's operations, programs, or activities conducted on the licensed premises, because of race, color, religion, sex, age, handicap, or national origin. The grantee will comply with the Americans with

**LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES**

CONTRACT NO. DACW38-3-10-5

Disabilities Act and attendant Americans with Disabilities Act Accessibility Guidelines (ADAAG) published by the Architectural and Transportation Barriers Compliance Board.

b. The grantee, by acceptance of this license, is receiving a type of Federal assistance and, therefore, hereby gives assurance that it will comply with the provisions of Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d); the Age Discrimination Act of 1975 (42 U.S.C. 6102); the Rehabilitation Act of 1973, as amended (29 U.S.C. 794); and all requirements imposed by or pursuant to the Directive of the Department of Defense (32 CFR Part 30C) issued as Department of Defense Directive 5500.11 and 1020.1, and Army Regulation 600-7.

16. TERMINATION

This license may be terminated by the grantee at any time by giving the said officer at least thirty (30) days notice in writing.

17. NATURAL RESOURCES

The grantee shall cut no timber, conduct no mining operations, remove no sand, gravel, or kindred substances from the ground, commit no waste of any kind, nor in any manner substantially change the contour or condition of the premises, except as may be authorized under and pursuant to the approved Annual Management Plan. The grantee may salvage fallen or dead timber; however, no commercial use shall be made of such timber. Except for timber salvaged by the grantee when in the way of construction of improvements or other facilities, all sales of forest products will be conducted by the United States and the proceeds therefrom shall not be available to the grantee under the provisions of this license.

18. ENVIRONMENTAL PROTECTION

a. Within the limits of their respective legal powers, the parties to this license shall protect the premises against pollution of its air, ground, and water. The grantee shall comply with any laws, regulations, conditions, or instructions affecting the activity hereby authorized if and when issued by the Environmental Protection Agency, or any Federal, state, interstate, or local governmental agency having jurisdiction to abate or prevent pollution. The disposal of any toxic or hazardous materials within the premises is specifically

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5

prohibited. Such regulations, conditions, or instructions in effect or proscribed by said Environmental Protection Agency, or any Federal, state, interstate, or local governmental agency are hereby made a condition of this license. The grantee shall not discharge waste or effluent from the premises in such a manner that the discharge will contaminate streams or other bodies of water or otherwise become a public nuisance.

b. The grantee will use all reasonable means available to protect the environment and natural resources, and where damage nonetheless occurs from the grantee's activities, the grantee shall be liable to restore the damaged resources.

c. The grantee must obtain approval in writing from said officer before any pesticides or herbicides are applied to the premises.

19. HISTORIC PRESERVATION

The grantee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural, or other cultural artifacts, relics, remains, or objects of antiquity. In the event such items are discovered on the premises, the grantee shall immediately notify said officer and protect the site and the material from further disturbance until said officer gives clearance to proceed.

20. DISCLAIMER

This license is effective only insofar as the rights of the United States in the premises are concerned; and the grantee shall obtain any permit or license which may be required by Federal, state, or local statute in connection with the use of the premises. It is understood that the granting of this license does not preclude the necessity of obtaining a Department of the Army permit for activities which involve the discharge of dredge or fill material or the placement of fixed structures in the waters of the United States, pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 USC 403), and Section 404 of the Clean Waters Act (33 USC 1344).

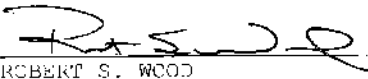
THIS LICENSE is not subject to Title 10, United States Code, Section 2662, as amended.

LOUISIANA DEPARTMENT OF
WILDLIFE AND FISHERIES

CONTRACT NO. DACW38-3-10-5


IN WITNESS WHEREOF, I have hereunto set my hand by authority
of the Secretary of the Army, this 22nd day of
April, 2010.

SECRETARY OF THE ARMY


ROBERT S. WOOD
Chief, Real Estate Division

THIS LICENSE is also executed by the grantee this 14th day
of April, 2010.

LOUISIANA DEPARTMENT OF WILDLIFE
AND FISHERIES


ROBERT S. WOOD
Secretary of the Department of
Wildlife and Fisheries

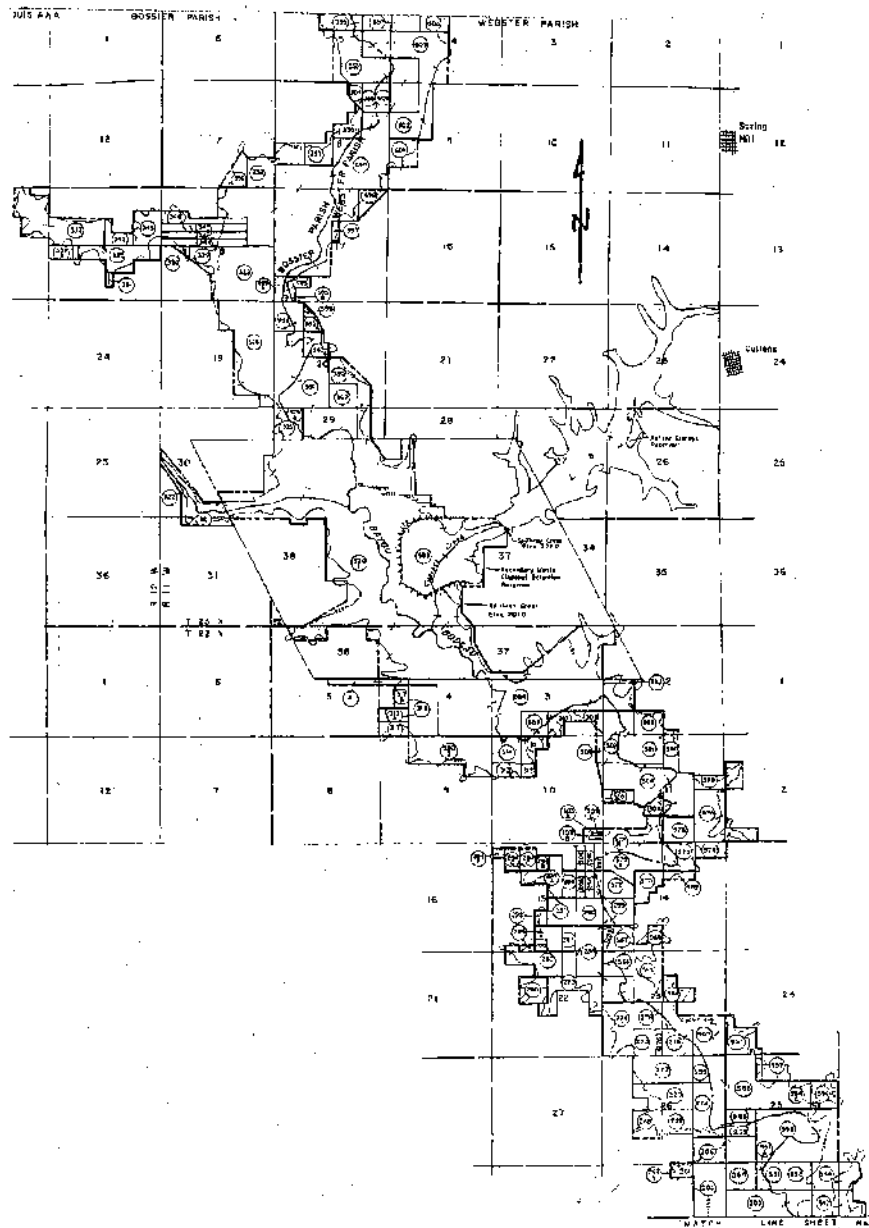


Exhibit "A-1"

BAYOU BODCAU, LOUISIANA
 LOUISIANA DEPARTMENT OF WILDLIFE &
 FISHERIES
 LICENSE CONTRACT NO. DACW38-3-10-5,
 32,766.08 ACRES, MORE OR LESS

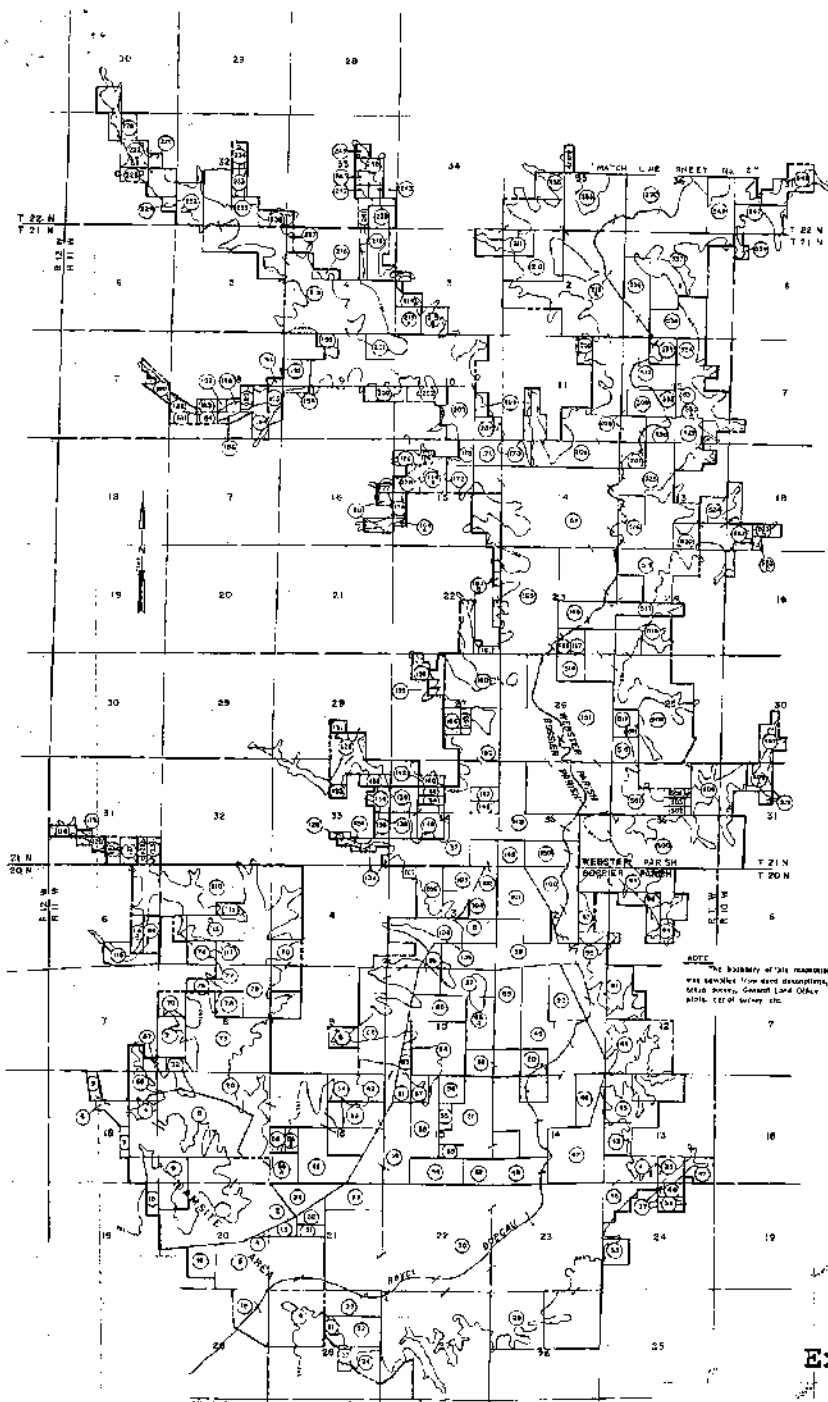
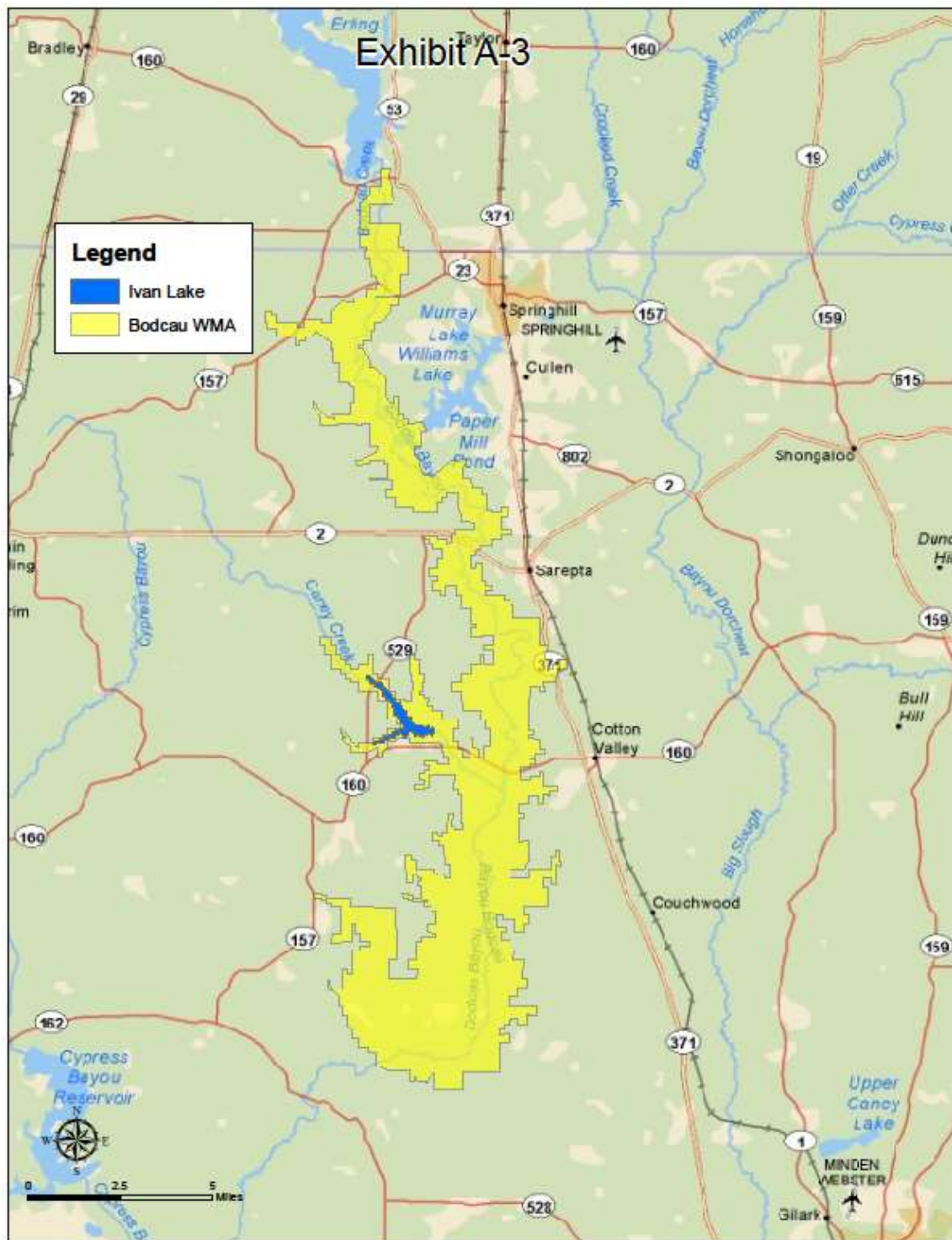


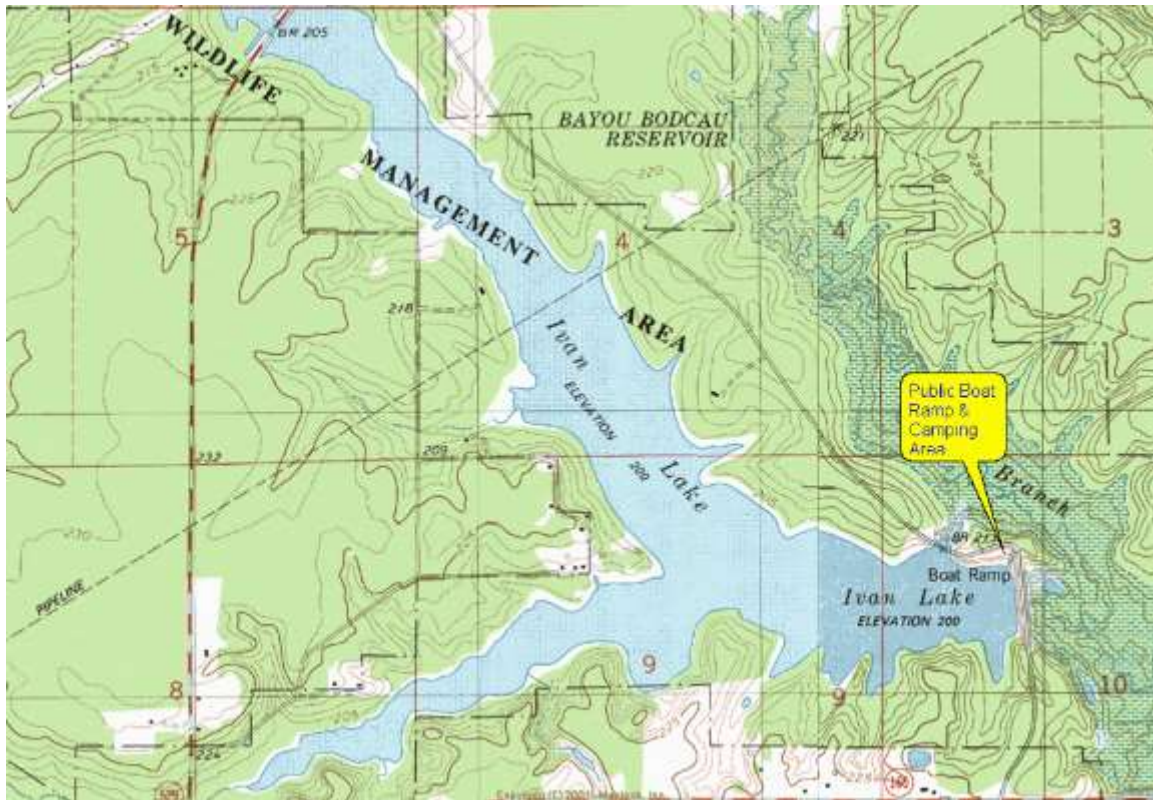
Exhibit "A-2"



APPENDIX II

([return to Boat Ramps](#))

Ivan Public Boat Ramps



APPENDIX III

[\(return to drawdowns\)](#)

Original Management Plan

IVAN LAKE MANAGEMENT PLAN

Introduction

Ivan Lake, located in northeast Bossier Parish, is an impoundment covering approximately 520 acres. The lake was created in 1956 with an earthen dam constructed across Caney Creek approximately $3\frac{1}{2}$ miles west of Cotton Valley, Louisiana. The lake has an area of about 520 acres at spillway level (200 ft. M.S.L.).

The lake was constructed without prior removal of timber. Upon flooding, this timber died forming a jungle of logs, dead snags, and stubble. This created a multitude of problems resulting in little recreational usage of the lake. The density of this dead timber prohibits water skiing entirely and limits swimming. Fish production, as a rule, is extremely poor in a lake that has had the timber left in it. Ivan is no exception to this rule.

Obnoxious aquatic vegetation is becoming a problem in the shallow area of the lake. At least seven (7) species of aquatic vegetation are found in the lake at this time. The most prevalent are of the submersed types to include, bladderwort, coontail, and two (2) species of pondweed. The emergent types consist of water-wild, water hyacinth, and cattail. Aquatic vegetation is presently found from the shore line to water five feet deep (195 M.S.L.) in moderate to heavy amounts. This vegetation creates problems in fish management and economically obstructs other water activities such as swimming and skating.

*L. M.
Ivan Lake*

The picnic area has been the victim of vandalism and is in need of repair and expansion to promote more usage.

The fertility of this lake is impossible to determine without an extensive study. From observation and taking into consideration the soil fertility of the surrounding area it appears that the water is infertile resulting in poor fish production.

Based on the above observations and findings the following management plans are suggested to give the citizens of Bossier Parish a place of recreation. The management plans are presented in two segments:

- A. A plan to rework this lake making it of such type that future management can be accomplished.
- B. A five year management plan to be initiated one year following completion.

INITIAL MANAGEMENT PLAN

Recommendations

I. Ivan Lake should be completely drained and allowed to dry. This should be publicized to allow the citizens to harvest as many fish as possible before the lake becomes dry.

A. The entire lake should be cleared of dead timber and debris. This can be accomplished with a dozer. This dead matter should be wind rowed and burned. This would create an open area for boating and water skiing and would also increase fish production.

B. If the above recommendation is found to be overly expensive or too extravagant an alternate plan is suggested.

1. The debris should be cleared, wind rowed and burned from the dam to the Phillip's Creek area (see map). Additional boat roads should be cleared from Phillip's Creek to Louisiana Highway 184. The small area northwest of highway 184 should remain wooded to provide a roosting area for waterfowl.

2. Subsequent areas should be cleared annually. This practice will eventually clean the lake of debris and at the same time distribute the cost over a longer period.

II. A concrete launching ramp should be constructed at the north end of the dam to provide fishermen and pleasure boat operators access to the lake.

III. A swimming area from the launching area to the spillway should be constructed by filling in with sand to produce a beach effect. This area should be marked and piling driven around it to prevent power boats from entering and creating a safety hazard.

IV. Construction of a T shaped pier would be beneficial to swimmers, sun bathers, and possibly provide angling for children.

V. The entire picnic area should be landscaped and concrete picnic tables constructed with at least two (2) tables being covered in the event of adverse weather conditions.

VI. A shallow well should be drilled and equipped with a hand pump to provide a source of safe useable water.

VII. The present rest room facilities are rpn down and should be rebuilt with expanded facilities to accommodate more people.

VIII. The picnic area should be fenced from livestock and treated for ticks.

IX. Additional gravel is needed to improve parish access roads.

X. Underbrush around the lake should be cleared to provide a park like area for hikers and campers. All green timber should remain as to provide habitat for wildlife such as birds and squirrels.

Upon completion of clearing and burning the dead matter, Ivan Lake will be filled with water and stocked with large mouth bass and bluegill sunfish by the Louisiana Wild Life and Fisheries Commission. Periodic checks will be made by commission personnel to promote a

balanced fish population and provide technical advice when necessary.

When the above suggestions are completed the citizens of Bossier Parish will have a recreational area that will provide water skiing, boating, swimming, picnicing, fishing, and in general enjoyment of the out of doors. The overall conditions of Ivan Lake and immediate area will be 100% improved and should be an attraction to Bossier Parish.

ANNUAL MANAGEMENT PLAN

Recommendations

This plan is suggested for five (5) years with a possible revision at the end of this time. This plan is to begin one year after restocking operations.

1. WATER LEVEL FLUCTUATION

An annual water level fluctuation program is recommended for

Even lake. Basically this constitutes dewatering the level of the lake a prescribed amount for a designated period then reflooding. This is a management tool designed to improve fishing, control obnoxious vegetation, and increase the fertility of the water.

Quite often the fish population of an impoundment tends to get "out of balance". This means the ratio between carnivorous and forage fish becomes upset, with the forage fish out numbering their predators. This is especially true in a body of water having excessive quantities of aquatic vegetation or large areas of trees and stubble.

This aquatic jungle provides extensive ~~habitat for~~ forage species such as bluegill and minnows and give them refuge from carnivorous fish such as large mouth bass. These forage fish reproduce at such a rate that they soon exceed the available food supply. The result is "stunted" fish. Their numbers are large; but few reach a desirable size. By lowering the water level, the forage fish are forced from hiding and concentrated in a smaller area. At this point the carnivorous fish can easily reduce the number of forage fish thereby continuing a "balanced population". Upon reflooding, the remaining fish will grow faster, with their off-springs having a higher growth rate, presenting the angler with desirable size fish.

Water fluctuation is also used to control obnoxious aquatic vegetations. It will ^{not} eliminate aquatic vegetation but will keep growth to a minimum. By drying and exposing the vegetation to the

sun, air, and freezing temperature, the mature plants will be killed and decomposed. This will delay the development of plants the following growing season, thereby, furnishing six (6) to nine (9) weeks more fishing time the next spring. A fluctuation program carried on for several consecutive years can gradually reduce the quantity of undesirable plants and provide more open water for fishing and aquatic sports.

A fluctuation program will also increase water fertility. The nutrients utilized by aquatic plants will be released upon decomposition of these plants and will be available to the fish population. The ~~nutrients chemically tied up in the soil will also be released on~~ exposure of the soil to air. Annual fluctuation must be practiced consecutively for a number of years to obtain full benefits.

The drawdown should begin on Labor Day. The level should be dropped at the rate of four (4) inches per twenty-four hour period until elevation 195 is reached. This level is to be held unless further drawdown is deemed necessary upon inspection by commission personnel.

Close the gates on December 15 and allow the lake to refill. Under normal conditions this should be accomplished by the last week in January.

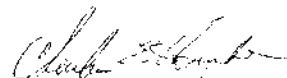
This program should be carried out annually for five years.

A program such as the one suggested for Ivan Lake will provide aquatic weed control, better fish production, increase the water fertility, and provide a productive and useful lake.

Respectfully submitted:

Robert Kimble
District 1 Supervisor

Lloyd Posey
Lake Management Project Leader


Charles E. Boenke
Fishes Biologist

APPENDIX IV
([return to Bossier](#))

Letter from USACE Concerning License Agreement



DEPARTMENT OF THE ARMY

LOUISIANA FIELD OFFICE
VICKSBURG DISTRICT, CORPS OF ENGINEERS
3505 SOUTH GRAND STREET
MONROE, LOUISIANA 71202-5273
PHONE (318) 322-6281

REPLY TO:
ATTENTION OF:

April 11, 2004

James Seales
Fisheries Biologist Supervisor
Louisiana Department of Wildlife and Fisheries
Inland Fisheries Division District 1
1401 Talton Street
Minden, LA 71055

Dear Mr. Seales:

The purpose of this letter is to inquire about the possibility of your agency assuming the operation, maintenance, and management of Ivan Lake and dam. As you know, Ivan Lake is located on U.S. Army Corps of Engineers property at Bayou Bodeau Dam and Reservoir. This lake has been leased by the Bossier Parish Police Jury for recreational purposes for the past 25 years. Their lease expired on April 6, 2005, and they have decided to not to renew it.

The Louisiana Department of Wildlife and Fisheries has done an excellent job in managing the wildlife and fisheries resources in the Ivan Lake area and Bayou Bodeau Reservoir. Unfortunately, our regulations do not allow us to assume operation, maintenance, and management of relinquished facilities. Therefore, unless another agency, local governmental body, or qualified quasi-public organization agrees to lease this area, then we may have no choice but to close it for public use. We may also have to drain the lake in the event that the dam becomes a safety hazard.

We certainly do not want to close Ivan Lake for public use or drain this lake, and we are seeking assistance from your agency to avoid adverse impacts. Please call me as soon as possible at 318-322-6391, Ext. 104 so we may discuss this matter. I will appreciate any assistance that you can offer.

Sincerely,

A handwritten signature in black ink, reading "Wayne R. Stogsdill, Jr." with a stylized flourish at the end.

Wayne R. Stogsdill, Jr.
Park Manager

APPENDIX V

([return to restoration](#))

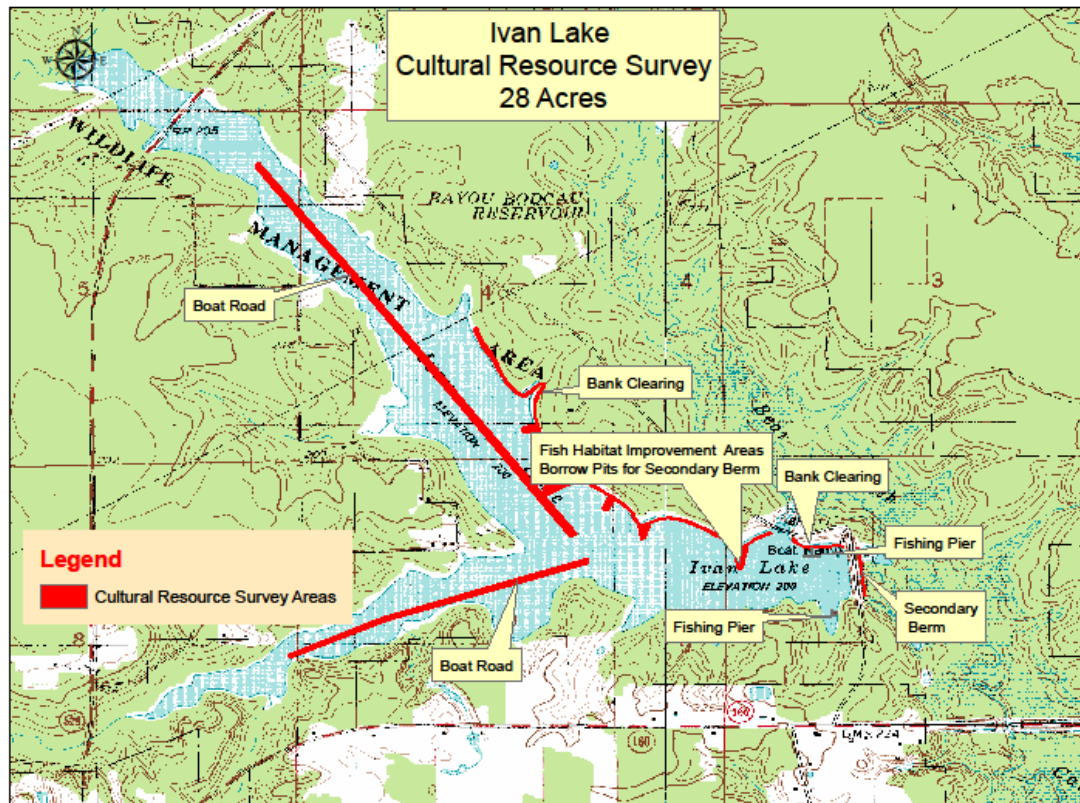
Conceptual Design of Lake Renovation Plan



APPENDIX VI

([return to document](#))

Cultural Resource Survey



APPENDIX VII

[\(return to hydrilla\)](#)

Ivan Lake Aquatic Vegetation Management Plan Prepared by Aquatic Plant Research & Control Section Inland Fisheries Division August 3, 2004

Ivan Lake is a 520-acre waterbody in Bossier Parish, created in 1954 by the United States Army Corps of Engineers. Ivan drains a fifty-five square mile area which calculates to a watershed ratio of 68:1. The lake was surveyed again this year to determine the presence and coverage of aquatic vegetation.

Hydrilla (*Hydrilla verticillata*), variable leaf milfoil (*Myriophyllum heterophyllum*) and coontail (*Ceratophyllum demersum*) are present in severe to moderate amounts in a fringe around the lake out to the six-foot contour. The area of the lake approaching the Highway 529 bridge is most severely impacted with boating access restricted to the creek channel. Bladderwort (*Utricularia* spp.) and fanwort (*Cabomba caroliniana*) are also present in problematic levels throughout the lake. All submerged species combined cover approximately 40% of the waterbody.

Several emergent species of aquatic vegetation were recorded in the lake. White water lily (*Nymphaea odorata*) covers large areas of the lake along with smaller areas of American lotus (*Nelumbo lutea*). The shoreline is lined by lizard's tail (*Saururus cernuus*), giant cutgrass (*Zizaniopsis miliacea*), cattail (*Typha* spp.) and smartweed (*Polygonum* spp.).

Hydrilla is an exotic species that is difficult to control and nearly impossible to eradicate. Hydrilla can usually out-compete native vegetation and when left unchecked will form monotypic stands of dense vegetation. Hydrilla produces reproductive structures, turions and subterranean turions, from which it can regenerate after control efforts. The subterranean turions, hereafter called tubers, are produced up to a foot deep in the hydrosol where they can remain viable for up to five years. These tubers are resistant to drying especially in heavy clay, organic soils. The main production of tubers is triggered when periods of daylight fall below thirteen hours.

One method of control for hydrilla and other submerged aquatics is the use of triploid Grass Carp (TGC). These sterile fish are very effective in the control of hydrilla when stocked in appropriate numbers and contained within the waterbody. To use TGC in Ivan Lake would require the construction of a permanent barrier on the spillway to prevent escape. This would also require routine maintenance for repairs and to remove debris that would collect against the barrier. Unless a funding source can be found for the construction and maintenance of the spillway barrier and purchase of the TGC this method is not an option.

The second method of control for hydrilla infestations is the use of EPA approved aquatic herbicides. These herbicides, when used correctly can give one or possibly two years of control. There are two types of herbicides, systemic and contact. The systemic herbicide applicable to this infestation, fluridone, is applied to the waterbody in appropriate amounts to treat the entire water column and be taken up by the plant causing chlorosis and eventually death. Fluridone is generally recommended in a total lake treatment due to

problems with dilution in spot treatments. Fluridone is extremely effective but is cost prohibitive in a waterbody of this size, a total lake treatment would cost an estimated \$59,000. Contact herbicides, such as endothall and diquat dibromide, although effective on hydrilla are also labor intensive. Contact herbicides, as the name implies, must be placed on the individual plants in the correct concentration for control. These herbicides must be diluted with the proper amount of water and injected into the masses of vegetation wherever control is desired. A cost estimate for an application to the existing vegetation with contact herbicides ranges from \$45,000 to \$90,000 dependent upon choice in herbicide.

The third method of control is habitat manipulation or drawdowns. Drawdowns are the low cost alternative which can give the desired results when used correctly. As stated previously hydrilla is resistant to drawdowns. A single drawdown will actually aid hydrilla by eliminating competing vegetation that is less drawdown resistant. Hydrilla tubers can survive five years in the hydrosol and can therefore survive infrequent dewatering. However, if a drawdown management plan is understood and adhered to, hydrilla can be controlled. The first fact that must be understood is that drawdowns stimulate tuber sprouting. This means that after one drawdown the vegetation will not be controlled and may actually appear worse. The drying of the water bottom stimulates approximately 80% of the tubers to sprout. This correlates to an 80% reduction in the amount of existing tubers in the hydrosol for next year. The drawdowns are also timed to prevent the main production of tubers in the fall. In summary the benefits of drawdown are the destruction of existing plants, the prevention of tuber production and the stimulation of existing tubers to sprout. The negative side of drawdowns is the impacts to recreational activities and irrigation.

The last method of control to be discussed is integrated pest management (IPM). This method is a combination of two or all three methods described above. Use of IPM could consist of a minimal drawdown in conjunction with herbicide applications to reduce the level of infestation. This reduction in vegetation would be followed in the fall by a light stocking of triploid grass carp. The advantage of IPM is the ability to reap the benefit of several control methods and not be dependent on the success or failure of just one method of control. The drawback to IPM is the combined cost of several control methods in addition to their individual disadvantages discussed previously.

Due to the infestation of submerged aquatic vegetation and lack of funding, it is recommended that a five-year, six-foot drawdown plan be considered. We recommend that the gates be opened September 13, 2004 allowing the lake to fall at the rate of 3-4 inches per day until it reaches the 194' MSL contour. The Department will survey the lake after the lake level reaches 194' MSL to assure dewatering of the majority of the vegetation. This six-foot drawdown should continue until January 24, 2005 when the gates should be closed to allow the lake to refill. The Department will conduct yearly surveys to monitor vegetation levels and adjust the management plan as necessary.

APPENDIX VIII

[\(return to Type Map\)](#)

VEGETATION TYPE MAP IVAN LAKE 2016

A vegetation typemap survey was performed by Kevin Houston on August 3, 2016. The lake was around pool stage during the survey.

Species Present

The following species were identified in Ivan Lake: American lotus (*Nelumbo lutea*), Eurasian milfoil (*Myriophyllum spicatum*), bladderwort (*Utricularia* spp.), southern naiad (*Najas guadalupensis*), hydrilla (*Hydrilla verticillata*), primrose spp. (*Ludwigia* spp.), horned pondweed (*Zannichellia palustris*), fragrant water lily (*Nymphaea odorata*), giant cutgrass (*Zizaniopsis miliacea*), common reed (*Phragmites australis*), pennywort (*Hydrocotyle* spp.), alligator weed (*Alternanthera philoxeroides*), watershield (*Brasenia schreberi*), and filamentous algae (*Pithophora* spp.) and giant salvinia (*Salvinia molesta*).

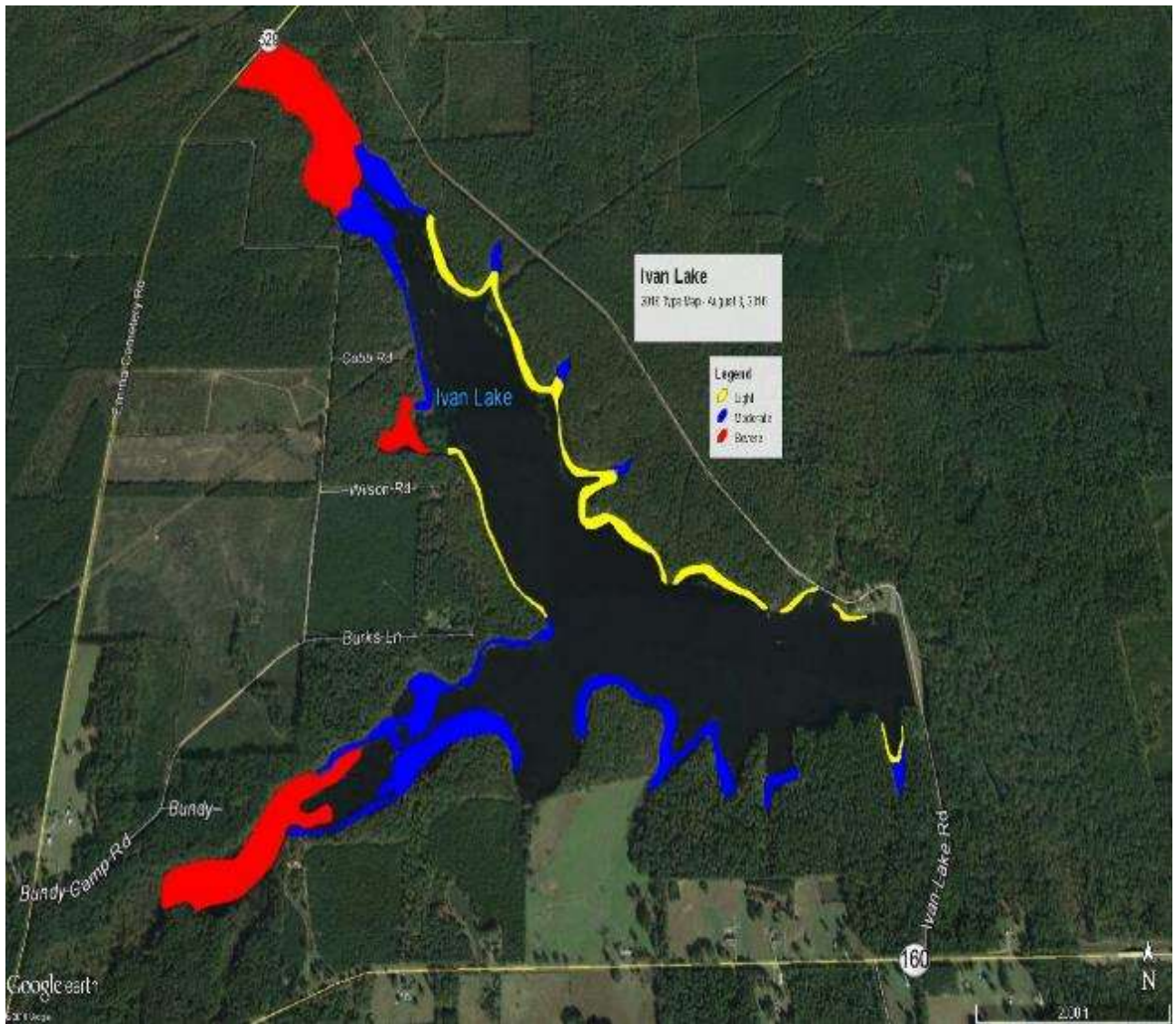
Severity

Aquatic vegetation covers approximately 24% (127 acres) of Ivan Lake. The most severe coverage is found in the upper reaches of each arm. The perimeter of the lake is primarily composed of cutgrass, buttonbush, and willow. American lotus and fragrant water lily cover approximately 100 acres around Ivan Lake. A fringe of both pad species can be found along any bank line; while larger mats can be found in the backs of pockets and upper ends of creeks. Submerged vegetation can be found in large clusters up both creek arms and within any patch of emergent mat. Where submerged vegetation is present, filamentous algae has gassed to the surface forming a floating mat.

In Caney Creek, emergent vegetation covers 90% of the surface from markers #45 and #46 upwards to the bridge. Most of that vegetation is fragrant water lily, but an emergent mix of lotus, watershield, pennywort, and alligator weed can also be found. Salvinia is present in the southern pocket below the pipeline. The salvinia looks dark and “sunburned”, and total acreage is around one acre. The bank line towards the mid-lake area has a light coverage of mixed vegetation. Submerged vegetation in Caney Creek is primarily milfoil, fanwort, coontail, and naiad.

In Phillip’s Creek, approximately 50% of the arm past marker #11 is covered with water lily, lotus, and large expanses of coontail. Much like Caney Creek, the filamentous algae has formed a mat above the submerged vegetation which has topped out near the bank. Above marker #17, coverage is 100 percent beyond the creek channel.

The lower reaches of Ivan Lake contain scattered clumps of vegetation including lotus, watershield, and coontail. Salvinia can be found in mixed patches of vegetation along the southern bank. Total acreage of salvinia is less than 1 acre on the southern end. A small patch of hydrilla and arrowhead are present near the boat ramp.



APPENDIX IX
[\(return to contaminants\)](#)

Fish Consumption Advisory



M. J. "Mike" Foster, Jr.
GOVERNOR

David Hood
Secretary
Department of
Health & Hospitals
P. O. Box 629
Baton Rouge, LA
70821-0629

J. Dale Givens
Secretary
Department of
Environmental Quality
P. O. Box 82215
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70884-2215

James H. Jenkins, Jr.
Secretary
Department of
Wildlife & Fisheries
P. O. Box 98000
Baton Rouge, LA
70898-9000

The following fish consumption advisory was issued on 11/20/00 by the Department of Health & Hospitals, the Department of Environmental Quality, and the Department of Wildlife & Fisheries. For more information, please contact:

DHH
Robert Starszak
(504) 568-8537

DEQ
Chris Roberie
(225) 765-0634

DWF
Gary Tilyou
(225) 765-2343

**FISH CONSUMPTION ADVISORY FOR
IVAN LAKE**

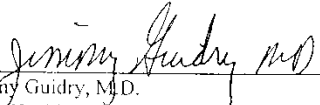
Based on fish sampling of Ivan Lake in Bossier Parish, unacceptable levels of mercury have been detected in bowfin and largemouth bass. Therefore, the Louisiana Department of Health & Hospitals, Department of Environmental Quality, and Department of Wildlife & Fisheries advise that the following precautions be taken when eating fish taken from Ivan Lake.

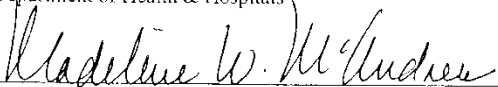
- **Pregnant women, breast-feeding women, women planning to be pregnant, and children less than seven years of age should NOT consume bowfin from the advisory area and should consume no more than ONE MEAL PER MONTH of largemouth bass (a meal is considered to be half a pound of fish for adults and children). There are no limits on other species.**
- **Non-pregnant women, women not planning to become pregnant, men, and children seven years of age and older should consume no more than TWO MEALS PER MONTH of bowfin but do not have to limit consumption of other species.**

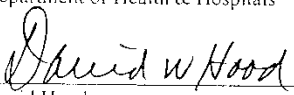
Mercury is an element that occurs naturally in the environment. It is released into the environment through natural processes and human activities. Consequently, there are small amounts of mercury in lakes, rivers, and oceans. Nearly all fish contain trace amounts of mercury. They absorb mercury from the water and sediment as they feed on aquatic organisms. Larger predator fish contain more mercury than smaller fish. Therefore, in general, it is recommended that smaller fish be consumed instead of larger ones.

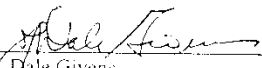
People are exposed throughout their lives to low levels of mercury. One way they can be exposed to mercury is from eating contaminated fish. Health effects from harmful levels of mercury can include nervous system and kidney damage. Developing fetuses are more sensitive to the toxic effects of mercury, especially in the first trimester. In addition to developing fetuses, infants and children are more sensitive to the effects of mercury; therefore, consumption advisories are issued at lower fish tissue concentration levels for these groups.

This advisory is issued as a precaution. Further sampling will be carried out by the Louisiana Department of Environmental Quality to determine the need for modifications to this advisory. If you have consumed bowfin and/or largemouth bass from these waters, it is not likely that there is an immediate need to be concerned about the effects of mercury. However, you should consult your personal doctor if you are concerned.


Jimmy Guidry, M.D.
State Health Officer and Medical Director
Department of Health & Hospitals


Madeline McAndrew
Assistant Secretary, Office of Public Health
Department of Health & Hospitals


David Hood
Secretary
Department of Health & Hospitals


Dale Givens
Secretary
Department of Environmental Quality


James H. Jenkins, Jr.
Secretary
Department of Wildlife & Fisheries

Appendix X

Ivan Lake Renovation Plan (2011)

Ivan Lake Renovation

Need:

Ivan Lake is a 520-acre impoundment created in 1954. Once known for its excellent bluegill and bass fisheries this lake located in central Bossier Parish, North Louisiana, has declined in productivity over the years. The lake has served as one of the major economic contributors to that portion of the parish and the town of Cotton Valley. The lake, located wholly within the confines for the Bodcau Wildlife Management Area, is currently under a long term lease agreement with the U.S. Army Corps of Engineers (USACE). In an effort to rehabilitate the lake the Louisiana Department of Wildlife and Fisheries (LDWF) entered into partnerships with the USACE, the Bossier Parish Police Jury and the Department of Transportation and Development.

Objective:

Restore the habitat and fisheries resources to Ivan Lake.

Approach:

LDWF has entered into an agreement with the USACE, Bossier Parish and the Department of Transportation and Development to renovate the habitat and fisheries resources of Ivan Lake. As part of the agreement, the Bossier Police Jury has dedicated \$250,000 to the replacement of the water control structure. LDWF's plans include:

- 1) Support Berm Construction – After the water control structure has been replaced, LDWF will contract work to remove approximately 8,300 cubic yards of soil from approved locations within the lake bed in order to create a stability berm on the downstream side of the dam. The attached map shows the zone in which the soil will be excavated.
- 2) Bank Improvement—several areas of Ivan Lake will be improved for bank fishing access by removing unwanted vegetation near the shoreline with a dozer (map attached – Figure 1). LDWF and local USACE personnel will enter into an MOU or cooperative endeavor in order to complete this task.
- 3) Gravel Beds—Gravel beds will be spread in strategic locations to improve spawning substrate. LDWF habitat barges will transport and deposit the gravel in the desired locations after the water has reached pool level.
- 4) Boat Lane Construction—each of the two arms of the lake extending westward contain dense stump fields which impede safe boat travel. The attached map (Figure I-A) shows an approximate boat road which will be created by a dozer. The removed stumps will be pushed to the side and heaped into piles for fish attraction. The boat lane boundaries will be marked with buoys in order to promote safe boating operation. Again, this will be completed within a cooperative endeavor between LDWF and local USACE personnel.
- 5) Artificial Reefs—artificial reefs will be constructed and placed by LDWF personnel into suitable deep water locations. These locations will be marked with buoys in order to promote use by anglers. The attached map shows possible reef

locations (Figure I-A).

- 6) Fishing Piers—LDWF will contract construction of several handicapped accessible fishing piers. The piers will be placed near borrow ditches for winter fishing opportunities and near creek bed channels/improved banks for spring & summer fishing. Piers may be enhanced with automatic fish feeders. The map in Figure I-A shows probable locations.
- 7) Land Improvements—the forested area south of the levee may be improved for parking, picnicking, and bank access. This area will be adjacent to one of the newly constructed piers.
- 8) Nuisance Aquatic Vegetation Protection—the boat ramp will be surrounded by a screened fence which will allow a small entrance/exit canal from the boat ramp to the main lake. This fence will be constructed of heavy-duty screened aquaculture material, pilings, cables, and buoys. The boat ramp area will be inspected for invasive aquatic vegetation on a routine basis. Any such vegetation will be removed by net in an effort to diminish introduction potential.
- 9) Rotenone Applications—LDWF employees will rotenone and flag net the small creek channel and borrow ditches that have held water in order to remove any remaining fish populations. The attached aerial photograph (Figure I-B) shows the extent of residual channel in need of rotenone application.
- 10) Fish Stocking— LDWF will provide and stock sportfish and forage species into Ivan Lake after water reaches pool elevation. The restocking effort should take place as soon as fish become available in order to establish a balanced population of desirable sportfish in the reservoir prior to natural reestablishment of fishes from the creek which may include undesirable rough fish. Plans are to stock desirable species at the following rates; approximately 100 Florida largemouth bass per acre, 1600 bluegill per acre, 400 redear per acre, 25 black crappie per acre, 20 channel catfish per acre, and 1000 threadfin shad per acre.

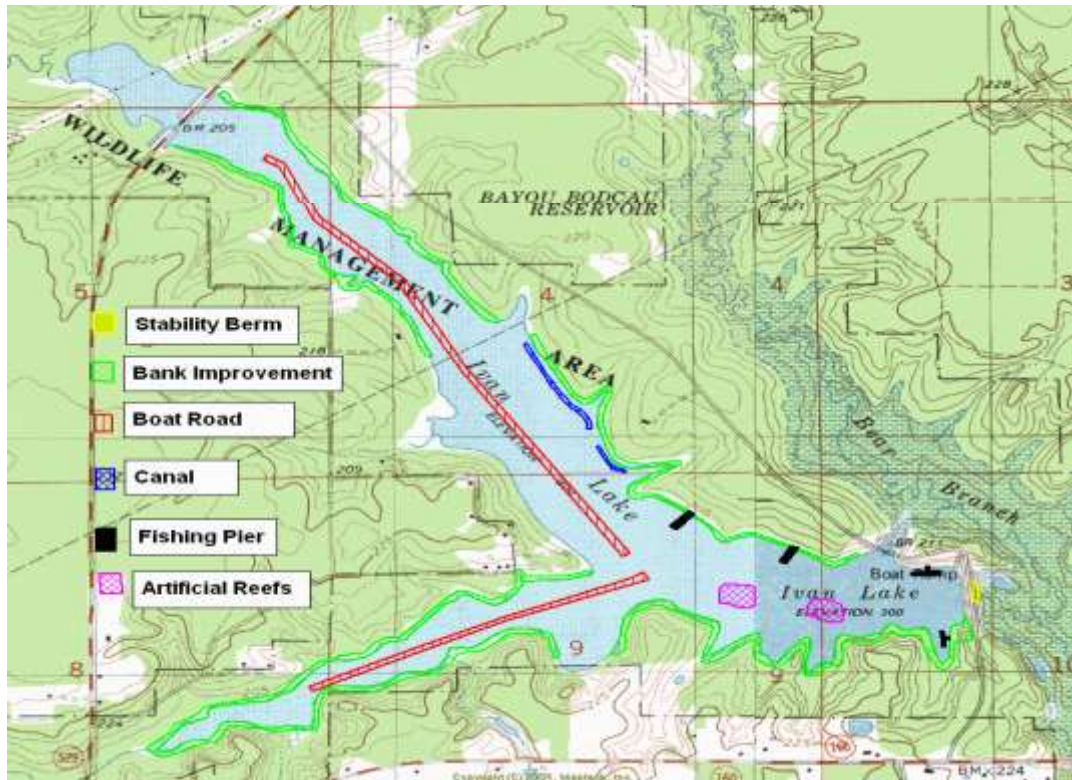


Figure I-A. Proposed improvements to fisheries habitat and for fishing access on Ivan Lake, LA.

The progress made to date (September, 2013) on items outlined in the Ivan Lake Renovation Plan above is reflected below – Progress Report on the Ivan Lake Renovation Plan.

Progress Report on the Ivan Lake Renovation Plan

Update: September 2013

Rotenone applications were made during the fall of 2010 with a follow-up treatment in the fall of 2011 in order to eliminate the existing fish population in the water remaining in the creek channel and borrow pits during the maximum drawdown. Item 9 of the Ivan Lake Renovation Plan has been completed.

The bank improvements outlined in item 2 of the renovation plan have been completed, along with access roads to these bank fishing areas.

The outflow pipe depicted in Figure II-A was replaced by the Bossier Parish Police Jury. Following this work, the support berm described in item 1 of the renovation plan was completed.

The boat lane described in item 4 of the renovation plan has been completed. The boat lane was created by a bulldozer and is easily visible in the aerial photograph in Figure II-B. This boat lane is well marked with navigational day marks mounted on pilings in accordance with the U. S. Aids to Navigation System (ATON), as shown in Figures II-C and II-D



Figure II-A. Outflow pipe for Ivan Lake, LA, following replacement by the Bossier Parish Police Jury. Photo taken in the spring 2012.



Figure II-B. Aerial photo of the newly created boat lane in Ivan Lake, LA. Stumps and obstructions were cleared by a bulldozer and the edges marked with pilings. Photo taken in fall 2011.



Figure II-C. Edges of the boat lane in Ivan Lake, LA were marked with day marks in accordance with the U.S. Aids to Navigation System (ATON). Photo taken in spring 2012.



Figure II-D. Boat lane markers on Ivan Lake, LA, at the intersection of Phillips and Caney Creeks. Photo taken in spring 2012.

Artificial reefs have been constructed by LDWF personnel as described in item 5 of the Ivan Lake Renovation Plan.

Restocking of the lake began in early 2012 when 186,357 bluegills and 84,192 redear sunfish were stocked during February and March. These sunfish measured 3" – 4" total length and were almost one-year-old at the time of stocking. Since that time, an additional 500,000 bluegill, 107,000 redear, 4,142 crappie, and 10,026 channel catfish fingerlings have been stocked. Ivan Lake received 42,003 Florida largemouth bass fingerlings in April 2012 and 300 adult FLMB brood in February 2013. After evaluating vegetation coverage in 2013, 600 triploid grass carp measuring 11-13" were also stocked. Lastly, 12,000 adult threadfin shad were stocked in an effort to increase the forage base.